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ABSTRACT

This study investigated differences among professional staff members' commitment to continuous learning and improvement in high-performing schools differentiated by student academic performance and disaggregated by race and socioeconomic status. A total of 48 high-performing schools were identified by Kentucky Department of Education staff based on their overall academic school index scores. One group of schools was relatively successful with struggling learners and minority and economically disadvantaged students, while another group was relatively successful with some students but not as successful with struggling learners and minority and economically disadvantaged students. The AEL Continuous School Improvement Questionnaire was administered to professional staff at each school. It focused on: shared leadership, effective teaching, school/family/community connections, purposeful student assessment, shared goals for learning, and learning culture. Data analysis indicated that there were wide variations in professional staff members' commitment to continuous learning and improvement between achievement groups and across building levels. Results also indicated that the area of school/family/community connections was one with the most need of intervention for schools in general. The results highlighted the importance fostering and sustaining a school climate where teachers are committed to continual learning and improvement. (SM)

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Student Achievement Gaps in High-Performing Schools:

Differences as a Function of the Professional Staff as a Learning Community

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Charleston, WV

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Introduction

Clearly, within the United States, the No Child Left Behind (NCLB) Act of 2001 raises the bar for schools and other educational entities to demonstrate yearly progress toward meeting the needs of all students. The NCLB establishes accountability requirements for measurable adequate yearly progress objectives for all students and subgroups of those students (Linn, Baker, & Betebenner, 2002). These student subgroups include socio-economic status, race/ethnicity, English language proficiency, and disability.

Research conducted by Louis, Marks, and Kruse (1996) suggests that one method by which schools can improve and thus meet the needs of all students, including subgroups, is through the activation of school-wide or professional learning communities. This research focused on the structural and human characteristics of 24 restructuring schools across the United States. Louis et al. defined professional learning communities as possessing five essential elements: shared values, focus on student learning, collaboration, deprivatized practice, and reflective dialogue. Findings suggest that variation in professional learning community exists between schools, especially across the elementary, middle, and high school building levels.

Hord (1997) also feels that the best way to foster school improvement is through the formation and maintenance of professional learning communities—communities of continuous inquiry and improvement. In Hord's view, the essential attributes of professional learning communities include supportive and shared leadership, collective creativity, shared values and vision, supportive conditions, and shared personal practice. Using those attributes as a starting point, Meehan, Orletsky, and Sattes (1996) developed and tested an instrument to measure professional learning communities in schools. In their study of nearly 800 teachers in a four-state region, they found important differences in perceptions of professional learning communities across building levels.

In the literature, there is much discussion regarding achievement gap differences of student subgroups in schools, but there is limited research regarding these differences within the context of professional learning communities and high-performing schools.

Purpose and Objectives

The purpose of this study was to investigate differences among professional staff's commitment to continuous learning and improvement in high-performing schools that were differentiated by student academic performance disaggregated by race and socioeconomic status.

The first objective was to administer the *AEL Continuous School Improvement Questionnaire* (AEL CSIQ) to the professional staff of 48 high-performing schools in one state. The conceptual framework for this instrument consists of six key concepts: shared leadership, effective teaching, school/family/community connections, purposeful student assessment, shared goals for learning, and learning culture. This 60-item self-report inventory has demonstrated valid and reliable results in several previous settings (Meehan, Cowley, Wiersma, Orletsky, Sattes, & Walsh, 2002). The instrument contains six scales representing the six key concepts, each composed of 10 items with Likert-type response options of 1 (not present) to 6 (present to a high degree). School performance on the instrument is a function of the combined perceptions of the professional staff (Meehan, Wiersma, Cowley, Craig, Orletsky, & Childers, 2002).

The second objective was to study and compare the descriptive statistics for those schools with minimal achievement gap differences by subgroup and those with large achievement gap differences by subgroup. The third objective was to determine whether significant differences occurred between these minimal and large gap schools. The fourth objective was to study and compare the descriptive statistics for schools by building level. The fifth objective was to determine whether significant differences occurred among building levels.

Data Sources

The 48 high-performing schools in this study were identified by staff at the Kentucky Department of Education from the population of all Kentucky schools (approximately 1,400). Criteria used for selecting these high-performing schools at each of three building levels (elementary, middle, and high) are described below.

1. Only schools with 1999-2000 standardized test data for all students and for students participating in a program for struggling learners were included.

2. Only schools with relatively large populations of students qualifying for the free and reduced lunch program were included; i.e., elementary schools with more than 25% eligibility, middle schools with more than 20% eligibility, and high schools with more than 10% eligibility.

3. Remaining schools were rank ordered from highest to lowest based on the overall academic index score for all students (this index included scores for reading, math, social studies, science, writing, arts and humanities, and practical living/vocational studies).

4. Data on the number of students in programs for struggling learners, the number of students in the free and reduced lunch program, and the number of African American students were inspected.

5. Schools were placed in two groups: (a) schools where students in programs for struggling learners, free/reduced lunch students, and African American students were all scoring within 10 points of the school average and (b) schools where students in the same subgroupings were scoring more than 10 points below the school average.

6. Schools were selected from each grouping that were generally representative of Kentucky schools and students on the basis of geography and demography.

Thus, all the schools in this study were identified as being relatively high performing based on their overall academic school index scores. One group was also relatively successful with struggling learners and minority and economically disadvantaged students; the other group was relatively successful with some students but not as successful with struggling learners and minority and economically disadvantaged youth. A sample of 48 schools was drawn from the remaining schools that met all of the above criteria, with 24 schools in each of the two achievement groupings. The 24 schools per group included 12 elementary, 6 middle, and 6 high schools.

Methods

A school contact person was identified to work with AEL staff in the administration of the AEL CSIQ. AEL staff assembled school packets that included copies of the instrument for all professional staff and a cover letter containing directions for administering and returning the completed questionnaires. These packets were mailed in the fall of 2001. After surveys were returned, AEL staff input all data using Remark scanning software and then exported the data files to SPSS for statistical analysis.

A total of 47 of the 48 Kentucky high-performing schools completed and returned the instrument (one minimal-gap elementary school did not return any completed surveys). After scoring the AEL CSIQs, one-page individual school profiles were prepared and mailed to each of the 47 schools that summarized each school's scores on the six scales. Data from these 47 schools were then aggregated and merged into one file that comprised the final data set for this study.

Descriptive statistics, box plots, and other graphs were generated by building level (elementary, middle, and high) and by achievement gap (minimal differences and large differences) for each of the six scales on the AEL CSIQ. General Linear Model Analyses of Variance were computed to identify significant main effects by building level and achievement gap for each of the six scales, as well as to detect any significant interactions between achievement gap and building level. Post hoc analyses (using the LSD and pairwise comparison methods) were conducted for all significant differences.

This study was an initial investigation of using the AEL CSIQ with schools identified as being high performing that have either minimal or large achievement gap differences to determine whether significant differences exist in terms of staff perceptions of the school as a professional learning community. Therefore, the alpha level was relaxed from a more traditional .05 level to .10 in order to detect as much differentiation as possible at this exploratory stage.

Results

Descriptive Statistics

Figure 1 displays a box plot for each of the six scales that denotes the distribution of the scores. The box represents the interquartile range, in which 50% of all schools have values (the upper boundary of the box represents the 75th percentile, the lower boundary represents the 25th percentile). The line inside the box denotes the 50th percentile or median. The lines extending above and below the box indicate the largest and smallest values falling outside the box but within 1.5 box lengths. Outlying schools (between 1.5 and 3.0 box lengths from the upper or lower edges of the box) are noted on each graph. Inspection of this figure shows that the scales of learning culture, purposeful student assessment, and effective teaching have smaller interquartile ranges, indicating more cohesion within the perceptions for these three areas across schools.

Table 1 provides descriptive statistics (number of schools, means, standard deviations, and 95% confidence intervals) for each of the six scales by building level and achievement gap. For the elementary schools, mean scale scores ranged from 47.98 for school/family/community connections to 51.01 for effective teaching on a 60-point scale; standard deviations ranged from 3.02 to 5.74. For the middle schools, mean scale scores ranged from 44.38 for school/family/community connections to 48.76 for purposeful student assessment; standard deviations ranged from 2.37 to 3.60. For the high schools, mean scale scores ranged from 46.81 for school/family/community connections to 49.21 for effective teaching; standard deviations ranged from 2.43 to 3.70. Overall, school/family/community connections received the lowest ratings for each building level and had two of the largest standard deviations. Conversely, effective teaching received the highest mean ratings at the elementary and high school levels, with two of the lowest standard deviations.

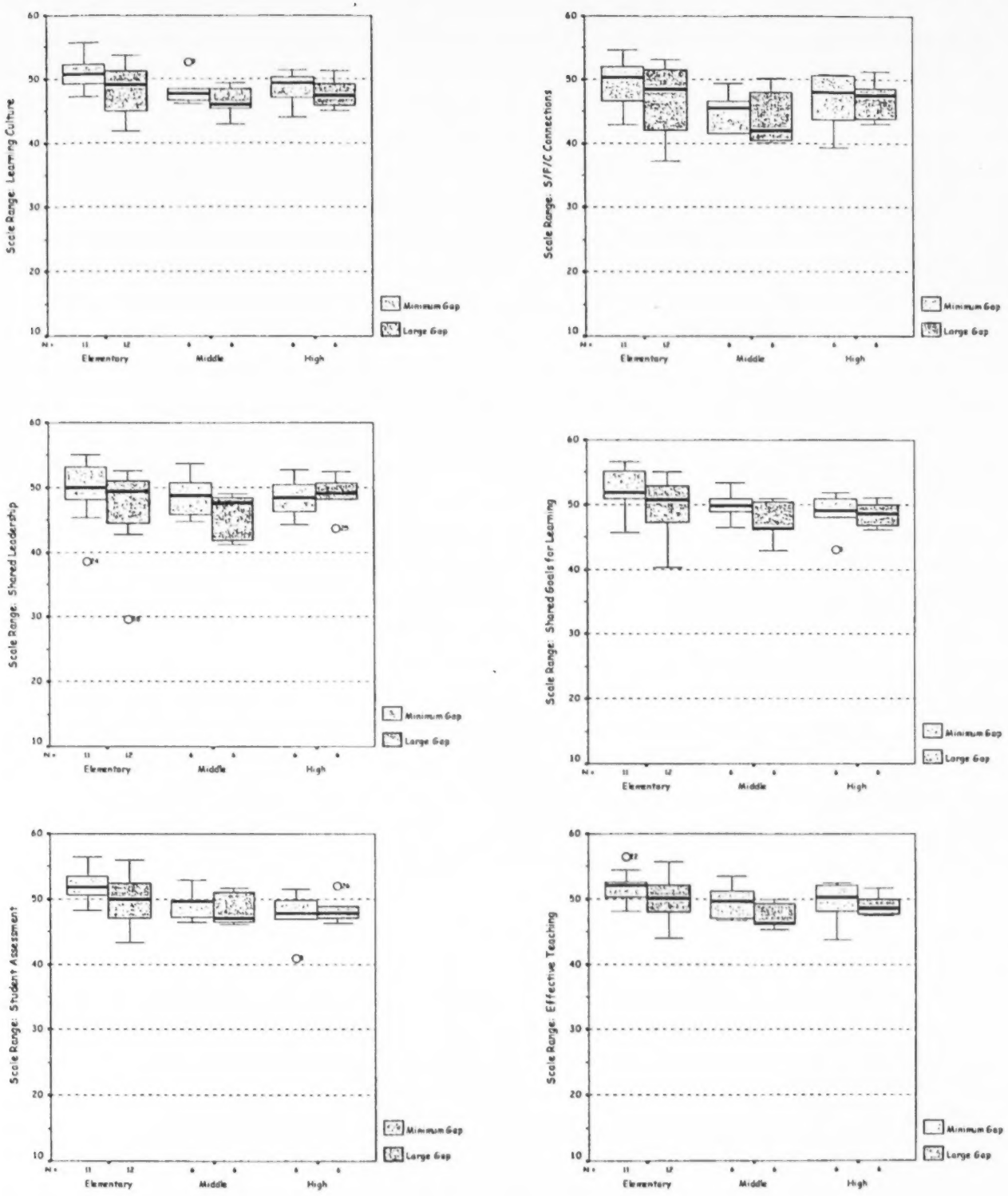

Figure 1: AEL CSIQ Box Plots by Building Level and Achievement Gap

Table 1: AEL CSIQ Descriptive Statistics by Building Level and Achievement Gap

Scales	Grouping	N	Mean	Standard Deviation	95% Conf. Intervals	
					Lower	Upper
Learning Culture	Elementary	23	49.61	3.54	48.08	51.14
	Middle	12	47.26	2.43	45.72	48.81
	High	12	48.10	2.45	46.55	49.66
	Minimum Gap	23	49.65	2.81	48.43	50.86
	Large Gap	24	47.65	3.19	46.30	49.00
School/ Family/ Community Connections	Elementary	23	47.98	4.82	45.90	50.06
	Middle	12	44.38	3.60	42.09	46.67
	High	12	46.81	3.70	44.46	49.16
	Minimum Gap	23	47.57	4.10	45.80	49.35
	Large Gap	24	45.98	4.69	44.00	47.96
Shared Leadership	Elementary	23	48.44	5.74	45.95	50.92
	Middle	12	47.36	3.59	45.08	49.64
	High	12	48.61	2.86	46.80	50.43
	Minimum Gap	23	49.16	3.97	47.44	50.88
	Large Gap	24	47.29	5.03	45.17	49.42
Shared Goals for Learning	Elementary	23	50.98	4.03	49.24	52.73
	Middle	12	48.53	2.93	46.67	50.40
	High	12	48.57	2.48	46.99	50.15
	Minimum Gap	23	50.69	3.39	49.22	52.16
	Large Gap	24	48.83	3.58	47.32	50.34
Purposeful Student Assessment	Elementary	23	50.97	3.47	49.47	52.47
	Middle	12	48.76	2.37	47.26	50.27
	High	12	47.86	2.83	46.06	49.66
	Minimum Gap	23	50.13	3.36	48.68	51.59
	Large Gap	24	49.11	3.24	47.75	50.48
Effective Teaching	Elementary	23	51.01	3.02	49.70	52.31
	Middle	12	48.42	2.52	46.81	50.02
	High	12	49.21	2.43	47.67	50.75
	Minimum Gap	23	50.60	2.76	49.41	51.79
	Large Gap	24	49.20	2.99	47.94	50.46

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For the schools with minimal achievement gap differences, mean scale scores ranged from 47.57 for school/family/community connections to 50.69 for shared goals for learning; standard deviations ranged from 2.76 to 4.10. For the schools with large achievement gap differences, mean scale scores ranged from 45.98 for school/family/community connections to 49.21 for effective teaching; standard deviations ranged from 2.99 to 5.03. Overall, school/family/community connections again received the lowest ratings for both groups and had one of the largest standard deviations; effective teaching again had one of the highest mean ratings and had the lowest standard deviations for both groups.

Figure 2 displays a graph for each of the six scales that denotes the overall spread of scores by building level and achievement gap. The graph denotes the mean score (box) plus or minus two standard deviations (the vertical line). Looking within building level, at the elementary school level the large-gap group had larger standard deviations than the minimal-gap group for each of the six scales, indicating a wider distribution of scores (i.e., a larger response range). At the middle school level, the large-gap group had larger standard deviations for four of the six scales (excluding learning culture and effective teaching). At the high school level, the minimal-gap group had larger standard deviations for all six scales. Overall, all of the minimal-gap elementary schools, most of the minimal-gap middle schools, and all of the large-gap high schools showed more cohesion and less dispersion in their perceptual scoring than their counterparts when looking within building level.

Looking within achievement grouping, the large-gap elementary schools had larger standard deviations than the middle or high schools for all six scales. The minimal-gap high schools had larger standard deviations for four of the scales; the minimal-gap elementary schools had the largest standard deviations for the two remaining scales (shared leadership and shared goals for learning). Overall, the large-gap middle and high schools and the minimal-gap middle schools showed more cohesion and less dispersion in their perceptual scoring than their counterparts when looking within achievement grouping.

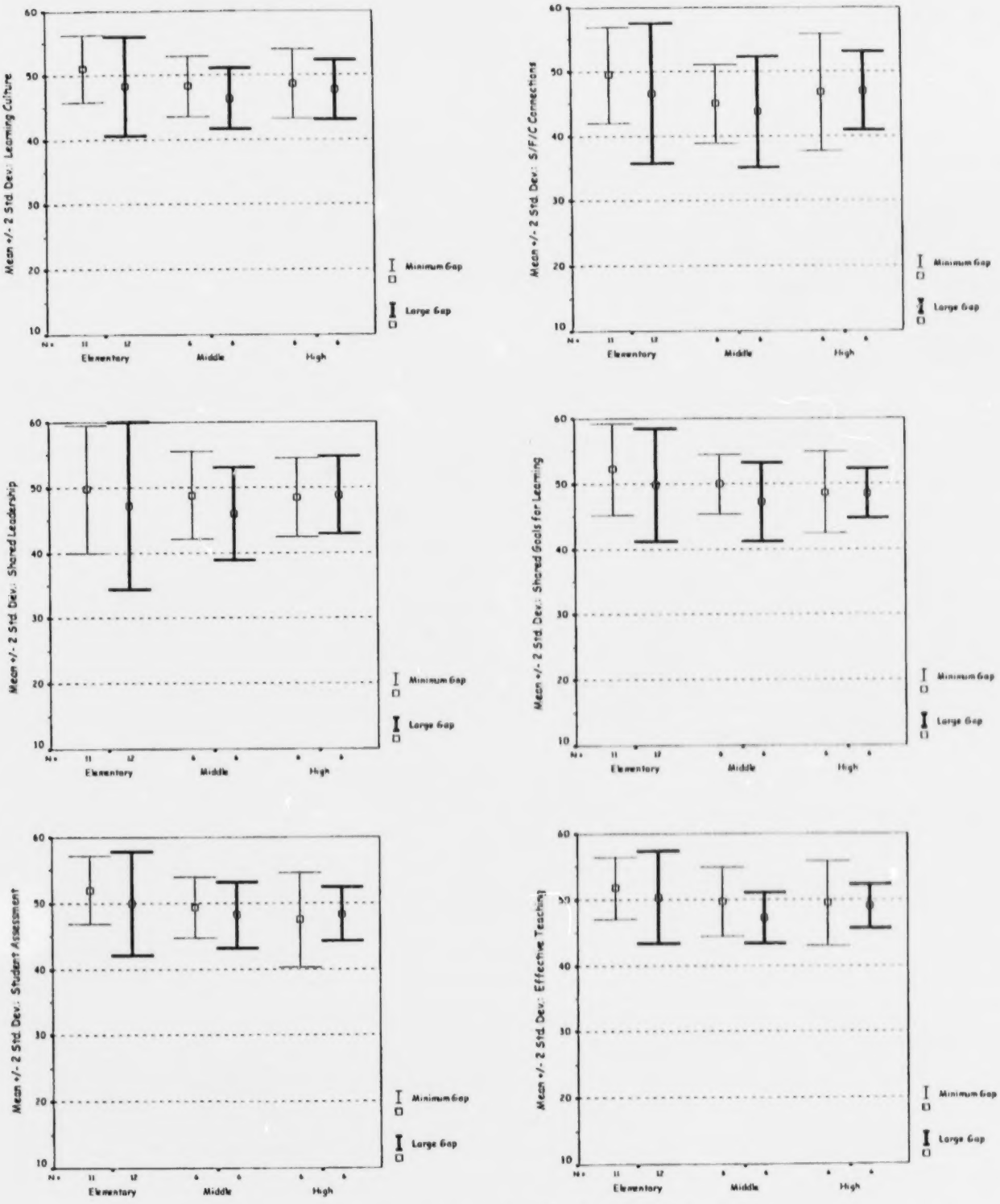
Mean +/- 2 Std Dev: Learning Culture
Mean +/- 2 Std Dev: S/F/C Connections
Mean +/- 2 Std Dev: Shared Leadership
Mean +/- 2 Std Dev: Shared Goals for Learning
Mean +/- 2 Std Dev: Student Assessment
Mean +/- 2 Std Dev: Effective Teaching
Minimum Gap
Large Gap
Elementary
Middle
High

Figure 2: Overall Spread of AEL CSIQ Scale Scores
by Building Level and Achievement Gap

Figure 3 presents the mean scores for each of the six scales by building level. This visual depiction accentuates two things. First, that elementary schools consistently scored higher than their middle and high school counterparts, except for the shared leadership scale. Second, it shows the closeness of the scores across scales and building levels. There was only a 7-point spread across all scales and building levels, from a rounded mean of 44 for school/family/community connections to a rounded mean of 51 for shared goals, purposeful student assessment, and effective teaching. And yet, as the next section will discuss, these slight differences were enough to indicate significant differences in perceptions of professional learning community among the groups.

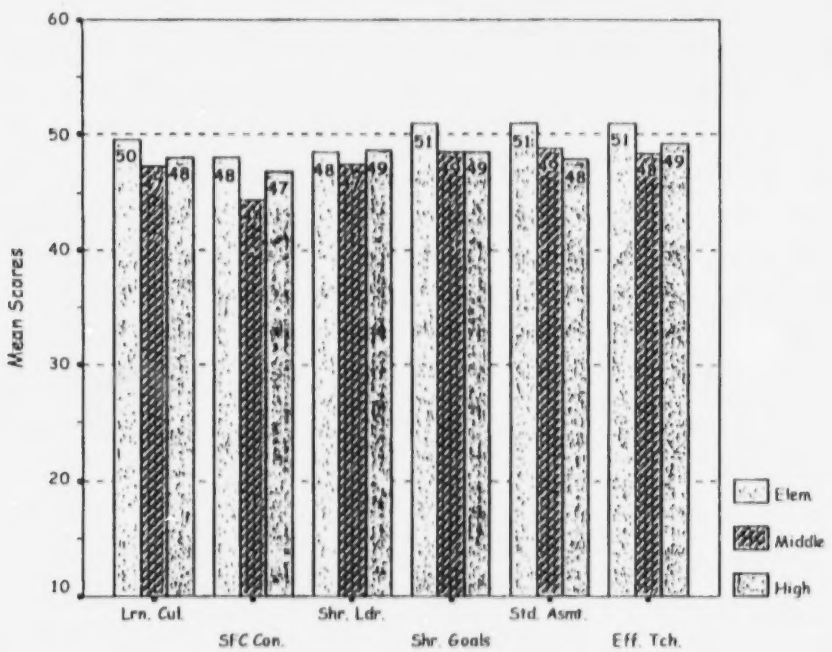

Figure 3: AEL CSIQ Mean Scale Scores by Building Level

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Figure 4 presents the mean scores for each of the six scales by achievement grouping. This visual depiction also accentuates two things. First, that minimal-gap schools consistently scored higher than their large-gap counterparts; second, the closeness of scores across scales and achievement groupings. There was only a 5-point spread across all scales for the two groupings, from a rounded mean of 46 for school/family/community connections to a rounded mean of 51 for shared goals for learning and effective teaching. And yet, as the next section will discuss, these slight differences were enough to indicate significant differences in perceptions of professional learning community between the groups.

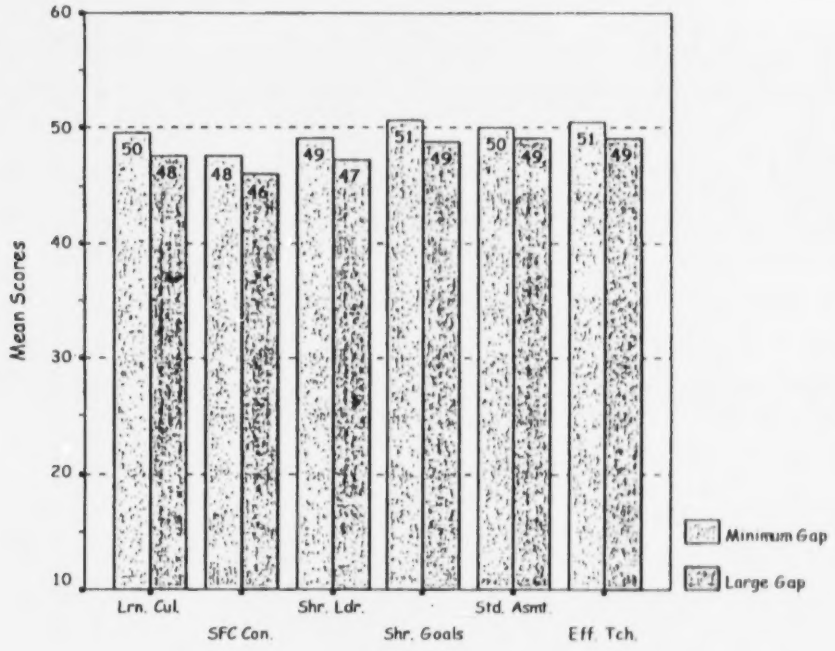

Figure 4: AEL CSIQ Mean Scale Scores by Achievement Gap

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Analysis of Variance

As shown in Table 2, the General Linear Model Analysis of Variance (GLM ANOVA) revealed significant main effects by building level for five of the six scales. Elementary schools had significantly higher scores than the middle schools for learning culture, school/family/community connections, and effective teaching; elementary schools had significantly higher scores than the middle and high schools for shared goals for learning and purposeful student assessment. Clearly, elementary respondents seem to have the most positive perceptions of their schools as professional learning communities. Conversely, middle school respondents are least likely to perceive their schools as professional learning communities.

The GLM ANOVA also revealed significant main effects by achievement group for three of the six scales. Schools with minimal achievement gap differences had significantly higher scores for learning culture, shared goals for learning, and effective teaching than those with large differences in achievement gap. Those schools that were more successful with all students in terms of academic achievement had higher perceptions of their schools as professional learning communities than those schools that were less successful with their struggling, disadvantaged, and/or minority students.

Shared leadership was the only area in which statistical significance was not detected by either building level or achievement gap. Further, no significant interactions were found between building level and achievement gap. This indicates that the significant differences found by building level and achievement gap are separate occurrences, i.e., they are not confounded, enhanced, or minimalized by the presence or absence of each other.

However, even with the statistically significant differences noted above, caution should be applied to interpreting these findings. First, the number of cases was limited, i.e., there were only six middle and six high schools in each of the two achievement groupings. Second, effect sizes are fairly small, which may indicate a lack of practical significance. In order to verify these findings, additional studies should be conducted on a larger scale with schools identified as high performing that can be classified as doing relatively well with all students and doing relatively well with some but not all subgroups of students.

Table 2: General Linear Model Analysis of Variance Results for the AEL CSIQ

Scales	*df*	*F*	Sig.	Partial Eta Squared	Results	Mean Difference
LEVEL						
Learning Culture	2	2.958	.063*	.126	Elem > Mid	2.35
S/F/C Connections	2	2.877	.068*	.123	Elem > Mid	3.60
Shared Leadership	2	0.283	.755	.014		
Shared Goals	2	3.192	.051*	.135	E > M & H	2.45, 2.41
Student Assessment	2	4.832	.013*	.191	E > M & H	2.21, 3.11
Effective Teaching	2	4.151	.023*	.168	Elem > Mid	2.59
GAP						
Learning Culture	1	4.171	.048*	.092	Min > Lrg	2.00
S/F/C Connections	1	0.960	.333	.023		
Shared Leadership	1	1.375	.248	.032		
Shared Goals	1	2.947	.094*	.067	Min > Lrg	1.86
Student Assessment	1	0.685	.413	.016		
Effective Teaching	1	3.039	.089*	.069	Min > Lrg	1.40
LEVEL x GAP						
Learning Culture	2	0.401	.672	.019		
S/F/C Connections	2	0.506	.606	.024		
Shared Leadership	2	0.451	.640	.022		
Shared Goals	2	0.572	.569	.027		
Student Assessment	2	0.897	.416	.042		
Effective Teaching	2	0.382	.685	.018		

*Significant at .10.

Note: The Levene test resulted in a nonsignificant value for each of the six dependent variables, indicating the error variance for each is equal across groups.

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Summary

This study makes several important contributions to the educational literature. States can identify high-performing schools and within those high-performing schools they can identify which schools best serve minority and disadvantaged subgroups of students; that is, those with minimal achievement gaps versus those with large achievement gaps. But, little is known about professional staff's commitment to continuous learning and improvement within both types of schools related to shared leadership, effective teaching, school/family/community connections, purposeful student assessment, shared goals for learning, and learning culture. This study helps fill that void. Findings suggest wide variations in professional staff's commitment to continuous learning and improvement between achievement gap groups and across building levels. Findings also suggest that the area of school/family/community connections is one area that may be most in need of intervention for schools in general.

If schools are trying to make yearly progress toward meeting the needs of all students, it is not enough to focus on structural changes, new standards, or accountability requirements. Rather, this study suggests that attention must also be given to fostering and sustaining a school climate where teachers are committed to continual learning and improvement. For schools with achievement gaps, this is especially true in the areas of learning culture, shared goals for learning, and effective teaching.

This was an exploratory study of achievement gap differences among student subgroups as a function of the commitment of faculty from high-performing schools to continuous learning and improvement. As such, this exploration has been successful in uncovering such differences in professional learning community as perceived by school staff. However, one shortcoming of this study is the limited number of cases. A second shortcoming is that data were aggregated at the school level, which does not account for differences attributable to other levels of interest. Specifically, this study did not account for differences in the individual students, the classrooms they attend, the grades of the classrooms, or the schools themselves. For future research, more sophisticated research techniques such as multi-level analysis should be utilized.

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